

Motorola

HOME RADIO

S E R V I C E M A N U A L

MODELS
53C1B
53C2B
53C3B
53C4B

CHASSIS
HS-400

GENERAL INFORMATION

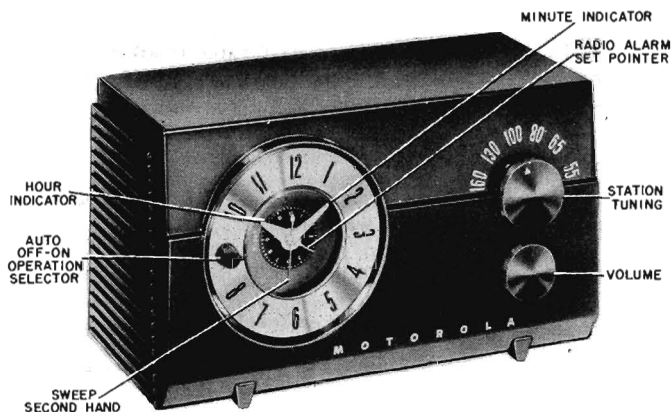
TYPE - AC table model superheterodyne with appliance outlet and self-contained electric clock for automatically controlling the operation of the radio and the outlet.

RECEIVER MODELS

Model	Color of Cabinet
53C1B	Walnut
53C2B	Tan
53C3B	Green
53C4B	Red

TUNING RANGE - 535 Kc to 1620 Kc IF - 455 Kc

TUBE COMPLEMENT - Type	Function
12BE6	Converter
12BD6	IF Amplifier
12AT6	Det, AVC & AF Amp
50C5	Power Amplifier
35W4	Rectifier



POWER SUPPLY - Operates from 117 volt, 60 cycle, alternating current only. Power consumption 37 watts.

APPLIANCE OUTLET - For use with 117 volt AC appliances rated only at 1100 watts or less.

CLOCK - Telechron self-starting electric clock, with Motorola face and hands.

INSTALLATION & OPERATING INSTRUCTIONS

The clock is self-starting and will operate when power cord is plugged into the power outlet. The sweep second hand will indicate when the clock is running. To set it, turn TIME SET knob (see Figure 1) in a clockwise direction only. The self-starting feature, in the event of a temporary electric power interruption, will re-start the clock but it will be necessary to correct for time lost by means of the TIME SET knob.

Your Motorola is ready to operate when you plug it into any 117 volt, 60 cycle AC power line. Do not attempt to

operate on DC as the clock motor will be damaged.

Radio reception can sometimes be improved by reversing the power plug in power outlet. Try it both ways and leave it in position giving best reception.

A built-in ferrite magnetic iron core antenna eliminates the need for an outside antenna. The antenna is somewhat directional, therefore, when receiving weak stations, reception may sometimes be improved by rotating the receiver slightly in either direction.

LIST APPLICABLE BULLETINS & SUPPLEMENTS HERE:

MOTOROLA, INC. 4545 AUGUSTA BLVD. CHICAGO 51, ILLINOIS

Part No. 68P631313

Price 10 Cents

Printed in U.S.A.

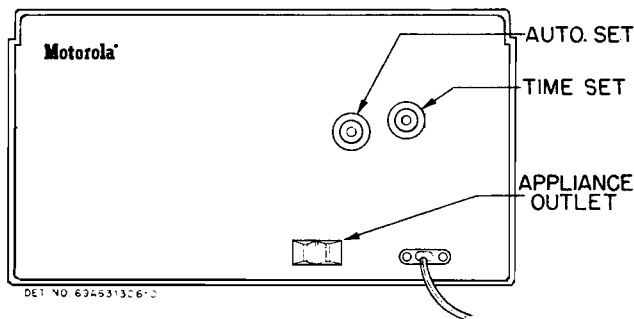


FIGURE 1. REAR VIEW OF RECEIVER

The radio tuning dial scale is calibrated in kilocycles minus the last significant figure. A station listed at 800 kilocycles would be tuned in at 80, etc.

MANUAL RADIO OPERATION

1. Turn OPERATION SELECTOR knob to ON. Allow a short period of time for tube warm-up.
2. Tune to desired station with the STATION TUNING knob.
3. Adjust volume control to desired level.
4. The radio will play until OPERATION SELECTOR is turned to OFF.

AUTOMATIC CLOCK-RADIO OPERATION

1. Turn OPERATION SELECTOR knob to ON. Allow a short period of time for tube warm-up.
2. Set the radio dial to the station you would like to hear

at any pre-determined time up to twelve hours in advance. Adjust volume to desired loudness.

3. Turn AUTO SET knob (see Figure 1) in a clockwise direction until RADIO ALARM SET POINTER indicates time radio is to be turned on automatically.
4. Turn OPERATION SELECTOR to OFF and then to AUTO position. Leave it in AUTO position.
5. The radio is now set to turn on automatically at time indicated by RADIO ALARM SET POINTER. It will continue to play until OPERATION SELECTOR is turned to OFF.

APPLIANCE OPERATION

The APPLIANCE OUTLET is located on the rear of the set. See Figure 1. Coffee-maker, heating pads, lamps, or any other electrical appliances which operate from 117V AC current and do not consume more than 1100 watts may be plugged into the APPLIANCE OUTLET. They will turn on automatically with the radio.

To turn on the appliance automatically at some pre-determined time, follow the AUTOMATIC CLOCK-RADIO OPERATION instructions. The radio will also come on with the appliance, serving as a reminder that the appliance has been turned on. If radio reception is not desired together with appliance operation, just turn VOLUME knob to minimum.

Appliances may also be operated manually, by following MANUAL RADIO OPERATION instructions. If radio reception is not desired with appliance operation, just turn VOLUME knob to minimum.

If radio is to be used alone, be sure to remove appliance plug from APPLIANCE OUTLET.

SERVICE NOTES

TO REMOVE RADIO CHASSIS FROM CABINET

1. Remove the four screws which hold the back cover; remove the cover and line cord.
2. Pull off the two control knobs from the front of the cabinet.
3. Remove the Phillips head screw under the tuning knob on the front of the receiver.
4. From the back, remove the screw which holds the line cord plug.
5. Disconnect the power leads to the radio chassis, speaker, and appliance receptacle.
6. From the back, remove the three screws that mount the

chassis to the cabinet.

7. Slide the chassis from the cabinet.

TO REMOVE CLOCK FROM CABINET

1. Remove the radio chassis as above.
2. Pull off the operation selector knob on front of cabinet.
3. Remove the four screws that hold the clock bracket to the cabinet.
4. Carefully remove the clock and clock bracket from the cabinet.
5. Remove the two small nuts and washers mounting the clock to the clock bracket.

CLOCK REPAIR INFORMATION

Telechron timers can be repaired at Authorized Telechron Service Stations or at the Product Service Department, Telechron Department, Ashland, Mass. Consult your Motorola Distributor for the name of the nearest Telechron Service Station, or refer to the classified section of the telephone directory in large cities.

The timer should be removed from the radio cabinet and packed carefully in order that no further damage results in shipment.

An acknowledgement with a quotation and a request for payment will be sent to the dealer before the repair is made. The timer will be returned to the dealer on receipt of payment. If the timer is within warranty, repairs will be made on a no-charge basis.

CIRCUIT DESCRIPTION

1. The circuit of this chassis is conventional -there are no built-in resistors or capacitors. Leads are printed on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.
2. The metal printing extends through all the holes on the chassis, connecting circuits on the front with those on the rear.
3. Reference to the schematic diagram and to Figure 3 will permit the circuit to be traced easily.

SAFETY PRECAUTIONS

1. The chassis of this receiver is connected directly to the power line. However, the power cord circuit is broken by an interlock when the cabinet back is removed for replacing tubes. When aligning or servicing the chassis from AC, an isolation transformer should be inserted between the power line and the chassis.
2. Do not service the chassis on a metal plate, because of the possibility of a short circuit.
3. Use caution when handling the chassis with power applied, because all high voltage leads are exposed.

4. The outer edges of the chassis and the large printed areas in the center are at ground potential.

COMPONENT REPLACEMENT

1. To prevent tube breakage, remove them before replacing components. **CAUTION:** Remove the tubes only by pulling them straight out. Wiggling a tube may bend a socket clip, causing poor contact with the tube pin.

2. **WHEN REMOVING DEFECTIVE COMPONENTS, USE ONLY A SMALL SOLDERING IRON (60 WATTS OR LESS) TO AVOID DAMAGE TO THE WIRING. DO NOT USE A SOLDERING GUN. WARNING: THE LEADS ARE VERY THIN, AND EXCESSIVE HEAT WILL BURN THEM OR LOOSEN THEM FROM THE BASE MATERIAL.**

3. Printed connections or leads, if damaged, may be replaced with a jumper of regular hook-up wire.

4. It is recommended that IF transformers, the volume control, or the electrolytic capacitor be removed by immersing all the lugs simultaneously into a small soldering pot. The component may then be lifted off the chassis easily. If a soldering pot is not available, heat each lug individually with a small soldering iron, and shake off as much molten solder as possible. Then, by alternately heating and loosening each lug, the entire component will be freed. The disadvantage of using a soldering iron instead of a soldering pot is that the printed connections may be pulled loose from the chassis.

5. An individual tube clip may be removed by squeezing it with a pliers and then unsoldering it. The new clip snaps into the hole.

6. Resistors or capacitors may be removed by unsoldering one end at a time.

CAUTION: Clean all the solder from the holes before installing a new component. Do not let the solder run onto an adjacent lead, as a short circuit will be created.

7. Be careful, when removing or replacing the volume control mounting nut or gang mounting screws, that the printing around the holes is not damaged.

ALIGNMENT

NOTE: If AC power is used, insert an isolation transformer between the power line and the receiver to avoid hum and electrical shocks. If an isolation transformer is not available, connect the low side of the signal generator to ground (the outer edges of the chassis) through a .1 mf capacitor.

1. Connect a low range output meter across the speaker voice coil.
2. Connect the low side of the signal generator to ground.
3. Set the signal generator for 400 cycle, 30% modulation.

4. Turn the receiver volume control to maximum.

5. Use a small fibre screwdriver for aligning the IF and diode transformers (a "K-Tran" alignment tool is recommended).

6. Adjust the signal generator output to produce .40 volts (.05 watts) across the voice coil. As stages are aligned, reduce the generator output (not receiver volume control) to maintain the .40 volt level, to avoid overloading the receiver.

7. See Figure 2 for adjustment locations and the following chart for procedure.

ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT						
1.	.1 mf	Grid of conv. (pin 7, 12BE6)	455 Kc	Fully open	1, 2, 3, & 4 (IF cores)	Adjust for maximum.
RF ALIGNMENT						
2.	.1 mf	Grid of conv. (pin 7, 12BE6)	1620 Kc	Fully open	5 (Osc)	Adjust for maximum.
3.	-	Radiation loop*	1400 Kc	Tune for max	6 (Ant)	Adjust for maximum.

*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

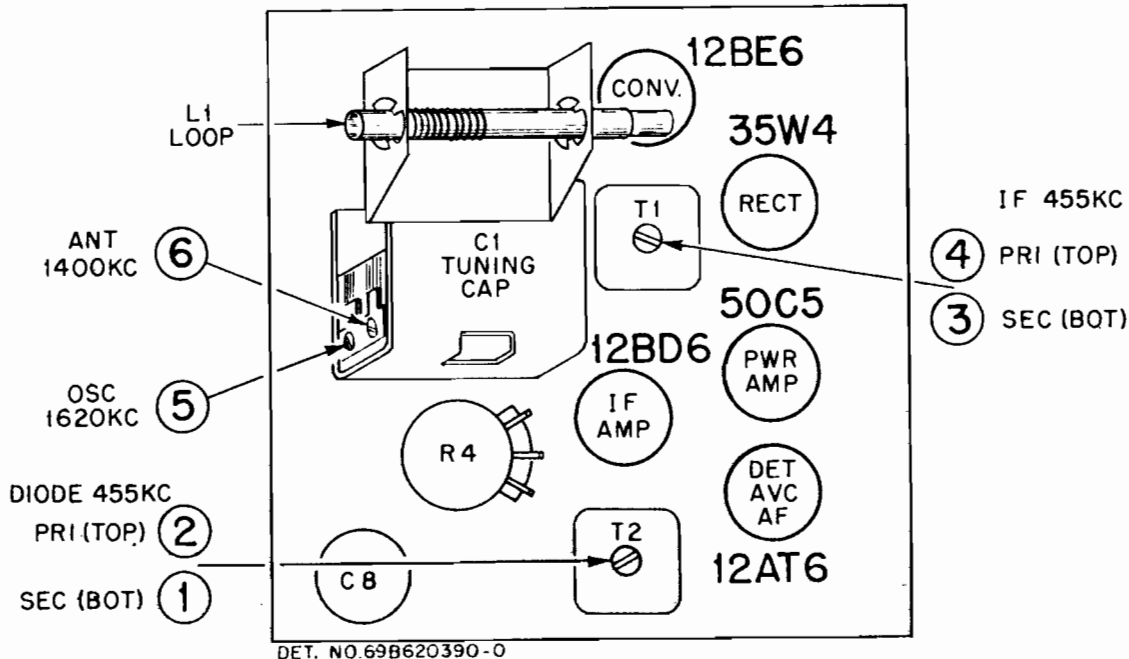


FIGURE 2. TUBE AND TRIMMER LOCATIONS

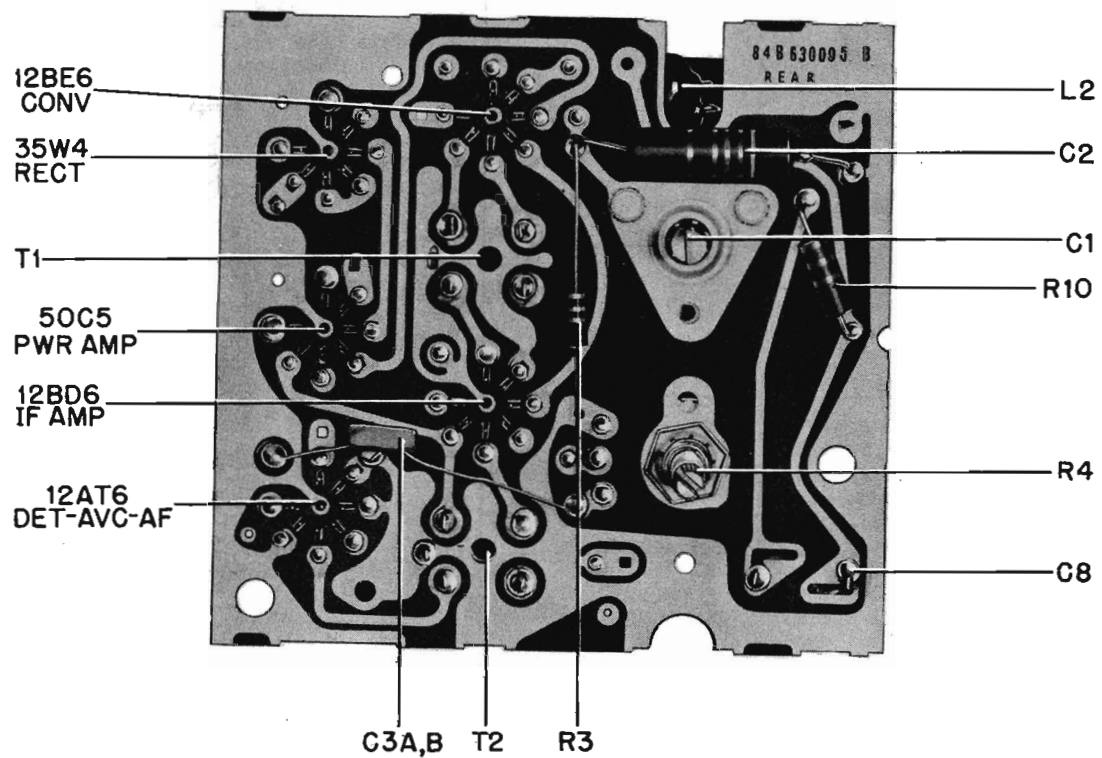
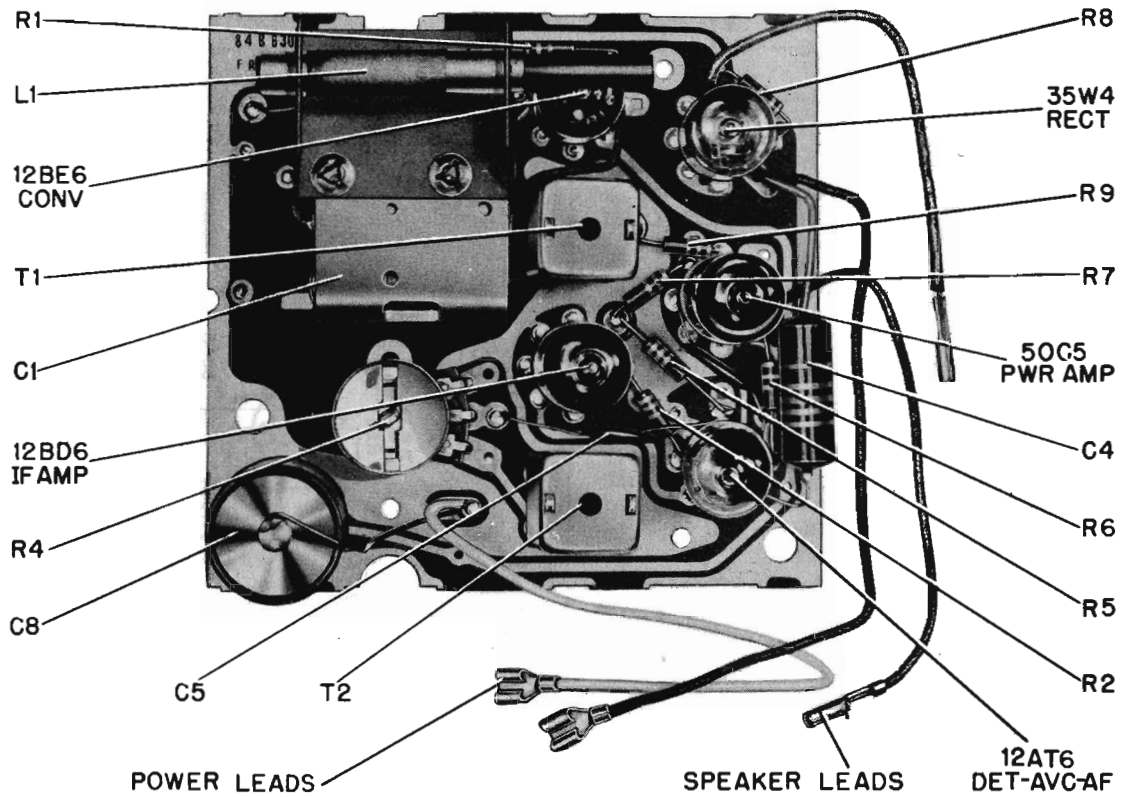


FIGURE 3. PARTS LOCATIONS

REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Ref. No.	Part Number	Description	List Price	Part Number	Description	List Price
CHASSIS PARTS - ELECTRICAL				1V620210	Insulator, antenna loop: fibre; with lug.....doz	.20
<u>Capacitors</u>				29A630230	Lug, terminal: AC connector....doz	.35
C-1	19B610626	Variable, 2-gang.....	2.75	2S7051	Nut, hex: Palnut; 3/8-32 x 9/16 (volume control mtg).....doz	.15
C-2	8K490206	Molded paper: 47,000 mmf 400V	.30	28A610679	Plug, line cord (interlock).....	.15
C-3A,B	21B484337	Ceramic, dual: 250-250 mmf 450V.....	.30	46B780452	Stud, trimount (antenna insulator mtg).....doz	.15
C-4	8R490232	Molded, paper: 47,000 mmf 400V	.30	29A620057	Terminal, pin (on speaker leads).....doz	.25
C-5	21R482726	Ceramic disc: 10,000 mmf 450V	.30	CABINET PARTS		
C-6	21R482726	Ceramic disc: 10,000 mmf 450V	.30	7A630204	Bracket, receptacle mtg.....	.05
C-7	23B610627	Electrolytic: 50-30 mf/150V.	1.95	7A630020	Bracket, speaker mtg.....doz	.50
C-8	8R9801	Paper: .01 mf 100V.....	.20	16E621760	Cabinet, table model: walnut; less clock, clock crystal and clock dial scale.....	5.35
<u>Clock</u>				16K621761	Cabinet, table model: tan; less clock, clock crystal and clock dial scale.....	6.40
E-1	59D622131	Electric Clock Assembly: Telechron; with hands NOTE: SEE SERVICE NOTES FOR CLOCK REPAIR INFORMATION.....	**	16K621762	Cabinet, table model: green; less clock, clock crystal and clock dial scale.....	6.40
<u>Coils</u>				16K621763	Cabinet, table model: red; less clock, clock crystal and clock dial scale.....	6.40
L-1	24A610646	Antenna loop: with core.....	.50*	30B630227	Cord, line: with plug and receptacle.....	1.35
L-2	24B630159	Oscillator coil.....	.20	1V630150	Cover, cabinet back: with line cord	2.10
<u>Speaker</u>				61A622114	Crystal, plastic (clock face cover).....	.15
LS-1	50K630232	Speaker: 4" PM; 3.2 ohm VC; includes T-3.....	4.70* exch 3.55	36K622112	Knob, operation selector: black (53C1B, 53C2B, 53C3B, 53C4B).....	.10
<u>Resistors</u>				36B622111	Knob, tuning control: black (53C1B, 53C2B, 53C3B, 53C4B).....	.25
Note: All resistors are insulated carbon type unless otherwise specified.				36B622107	Knob, volume control: black (53C1B, 53C2B, 53C3B, 53C4B).....	.15
R-1	6R6028	22,000 20% 1/2W.....doz	1.20	4S7667	Lockwasher, #4 ext (clock mtg).....per/c	.50
R-2	6R6018	100 20% 1/2W.....doz	1.20	29A630230	Lug, terminal: AC connector....doz	.35
R-3	6R2118	3.3 meg 20% 1/2W.....doz	1.20	2S7019	Nut: 4-40 x 1/4 x 3/32 hex (clock mtg).....per/c	.50
R-4	18A622120	Volume control: 1 meg without switch.....	.80	28A610679	Plug, line cord (interlock).....	.15
R-5	6R2109	10 meg 20% 1/2W.....doz	1.20	1V630275	Receptacle, appliance: with lugs (loop panel mtg).....	.35
R-6	6R6032	470,000 20% 1/2W.....doz	1.20	34B622113	Scale, clock dial: brass.....	.60
R-7	6R6032	470,000 20% 1/2W.....doz	1.20	3S115138	Screw, machine: 6-32 x 1-9/16 Phillips flat head; cad pl (chassis mtg -through front of cabinet).....doz	.20
R-8	6R5683	27 10% 1/2W.....doz	1.20	3S120431	Screw, thread-cutting: #6 x 3/8 slotted hex head; cad pl (spkr mtg).....doz	.15
R-9	6R3992	150 20% 1/2W.....doz	1.20	3S120430	Screw, thread-cutting: #6 x 1/2 slotted hex head; cad pl (chassis mtg).....doz	.20
R-10	6R3953	1000 20% 1W.....	.20	31A630229	Terminal strip (AC connector).....	.10
<u>Transformers</u>				4S7667	Washer, #4 ext: cad pl (clock mtg).....per/c	.50
T-1,2	24K610639	IF and Diode transformer: 455 Kc: complete.....	1.50	CHASSIS PARTS - MECHANICAL		
T-3	25K610631	Output Transformer.....	1.50	42A610632	Clip, tube pin.....per/c	.50
Part Number	Description		List Price			

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

*Plus Federal Excise Tax At Current Rate

**Prices Furnished Upon Request

